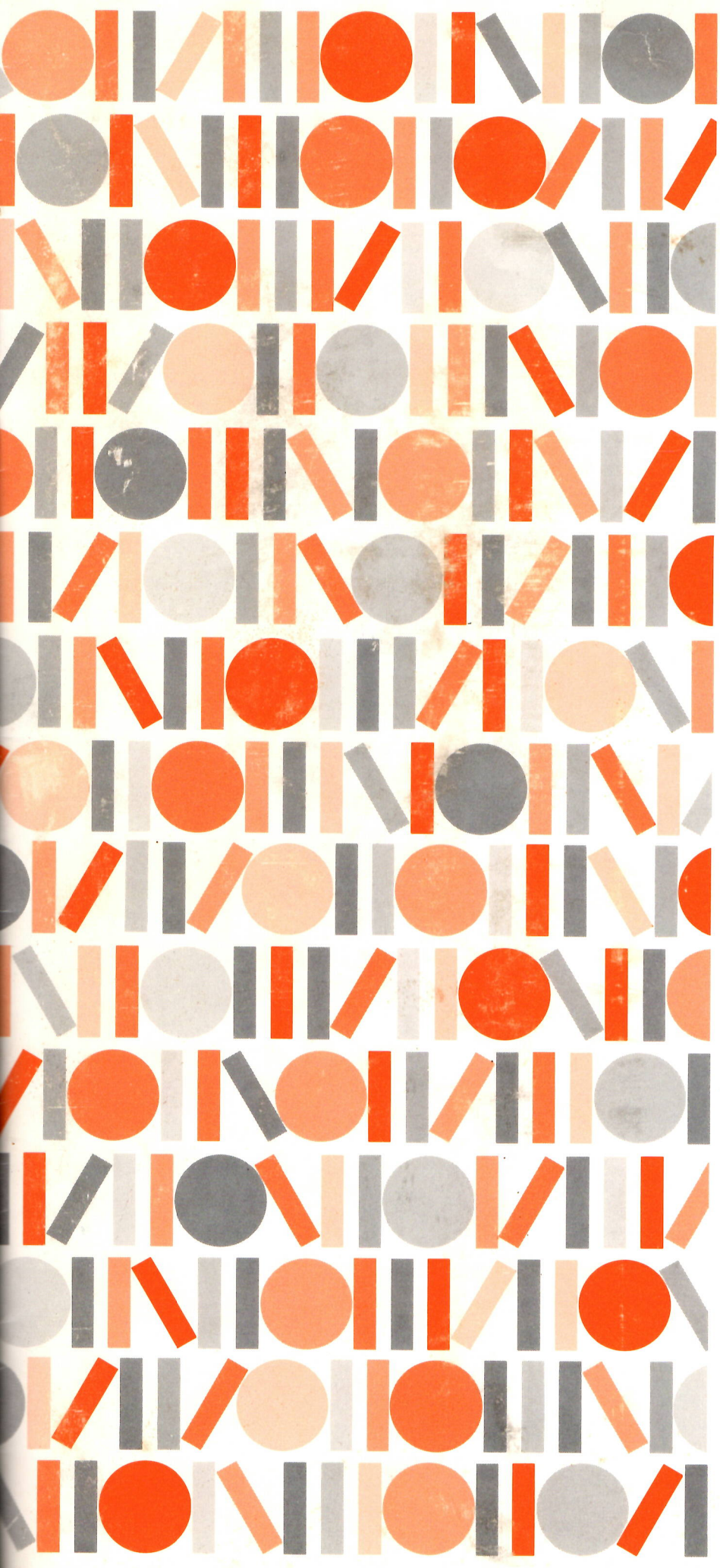


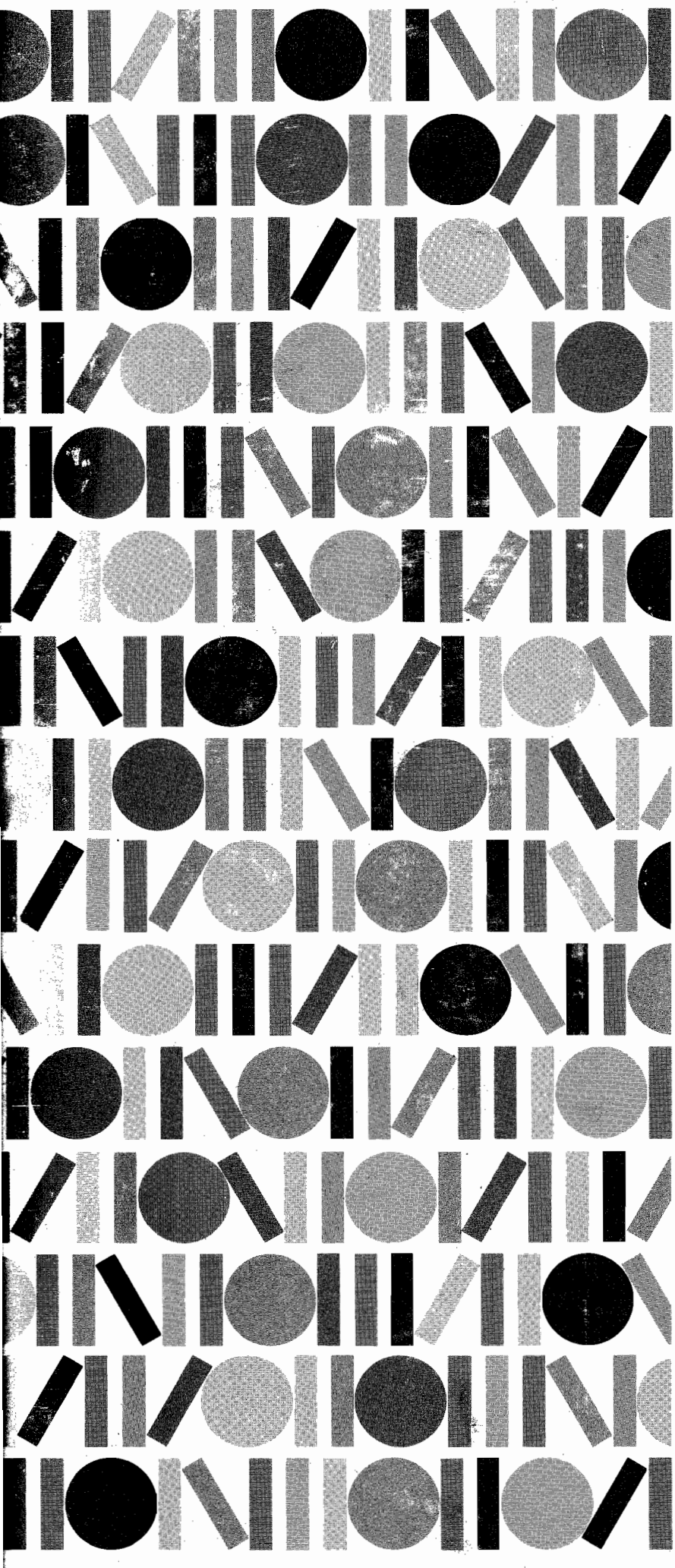
OPERATING MANUAL

DAISY WHEEL PRINTER

SILVER REED EXP 400

PARALLEL/SERIAL

SILVER REED



OPERATING MANUAL

DAISY WHEEL PRINTER

SILVER REED EXP 400

PARALLEL/SERIAL

SILVER REED

FCC NOTICE (U.S.A. only)

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- — Reorient the receiving antenna
- — Relocate the equipment with respect to the receiver
- — Move the equipment away from the receiver.
- — Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/ television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio TV Interference Problems"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

A shielded cable must be used for the connection between the printer and the host computer.

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PREFACE

Thank you very much for your purchasing our daisy wheel impact printer. This printer is designed to offer true letter-quality printing at an economical price and furthermore the following features:

1. Top-quality printing at 10 cps.
2. Serial or line print mode can be selected.
3. Printing is bidirectional in the line print mode.
4. Using ESC sequence, minimum increments of 1/120 inch for carriage movement and 1/48 inch for paper feed can be obtained in the serial print mode.
5. Supports leading wordprocessing packages.
6. Optional form tractor is available for handling computer output paper.

This Operating Manual covers both the parallel and serial versions.
If your printer is a parallel version, skip the "Serial Interface" section. If your printer is a serial version, skip the "Parallel Interface" section. Other sections in this manual are concerned with all the users regardless of your model.

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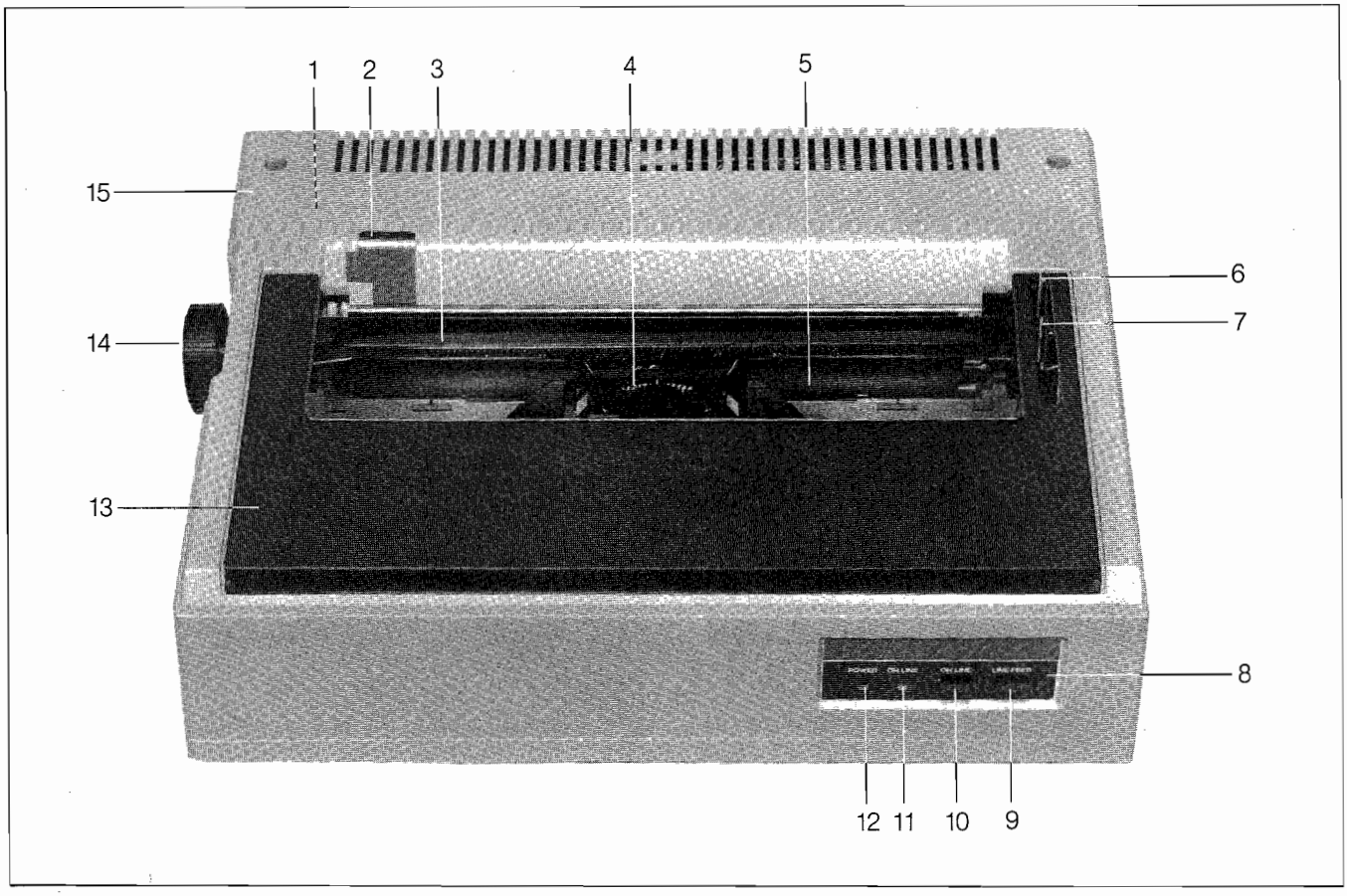
1. SPECIFICATIONS

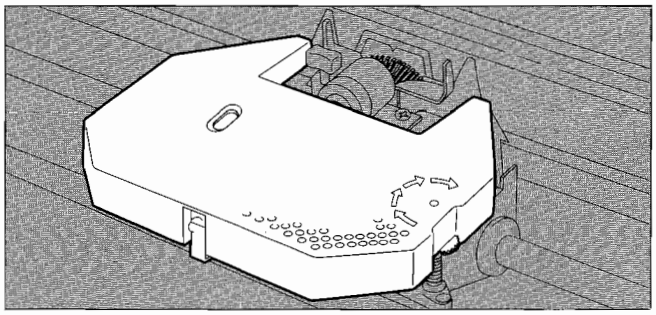
Type:	Daisy wheel impact printer
Main body:	Power supply, control board, printing mechanism, paper feed mechanism, carriage feed mechanism, control panel, operating levers.
Interface:	Parallel: Centronics compatible Serial: RS232C
Printing speed:	10 CPS (Shannon text with 10 pitch), 12 CPS maximum
Daisy wheel:	96 characters (Double molded)
Printing pitch:	10 characters/inch
Carriage movement:	1/120 inch minimum
Printing direction:	Bidirectional
Carriage return:	1200 ms / 8.1 inches (206 mm)
Paper width:	11.8 inches (300 mm)
Printing width:	8.1 inches (206 mm), 82 characters/line
Copy capacity:	1 original + 3 copies
Paper feed:	Friction feed system
Paper feed speed:	2.5 inches/second
Line feed:	1/48 inches (0.53mm)
Ribbon:	Multi-strike film ribbon (standard) One-time film ribbon Fablic ribbon
Control panel:	Switch: ON LINE, LINE FEED Lamp: POWER, ON LINE
Operating levers:	Paper release lever, Paper bail lever
Power rating:	100V, 115V, 220V, 240V AC (50/60 H)
Power consumption:	55W
Dimentions:	15.6(W) × 5.0(H) × 12.4(D) inches / 398(W) × 128(H) × 316(D) mm
Weight:	15.4 lbs / 7kg
Operating conditions:	When in use: Temperature 10° — 40°C Humidity 20 — 80% (No condensation) In storage: Temparature – 20°C — 70°C Humidity 5 — 90% (No condensation)
Noise level:	65 dB or less (A scale 1m)
Reliability:	MTBF 2,500 hours (25% duty)
Options:	Form tractor

2. DESCRIPTION

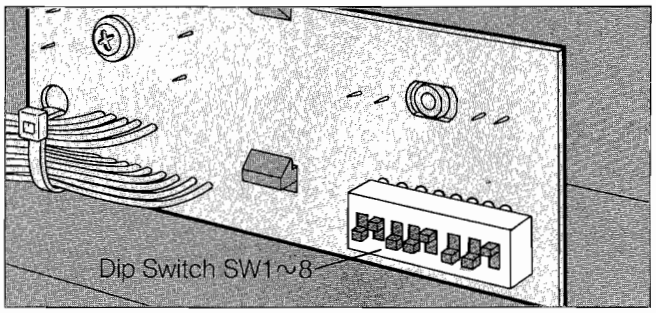


1. Power Switch
2. Paper Guide
3. Paper Bail
4. Daisy Wheel
5. Platen
6. Paper Release Lever
7. Paper Bail Lever
8. Control Panel
9. LINE FEED Switch
10. ON LINE Switch
11. ON LINE Lamp
12. POWER Lamp
13. Top Cover
    Open this cover when you replace a daisy wheel or ribbon.
14. Platen Knob
    (Platen Variable)
15. Upper Cover

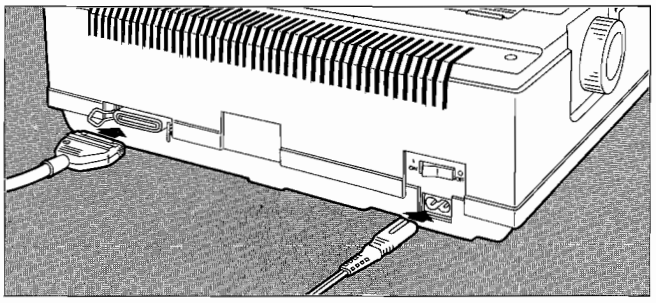
3. PREPARING THE MACHINE FOR OPERATION



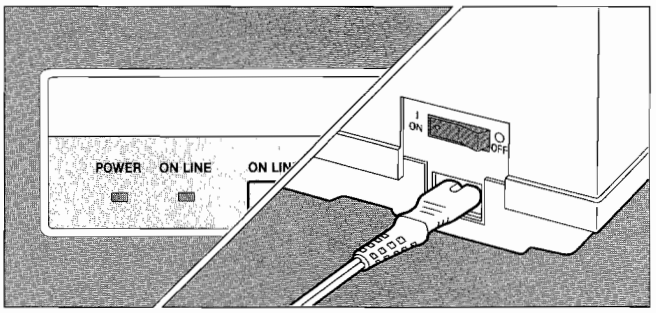
1. Check that a daisy wheel (10 pitch), cassette ribbon (multi-strike film ribbon), and power cord are packed with the printer. The ribbon is installed on the carriage.
2. Install the daisy wheel and cassette ribbon on the carriage. (See page 7 and 5 respectively.)



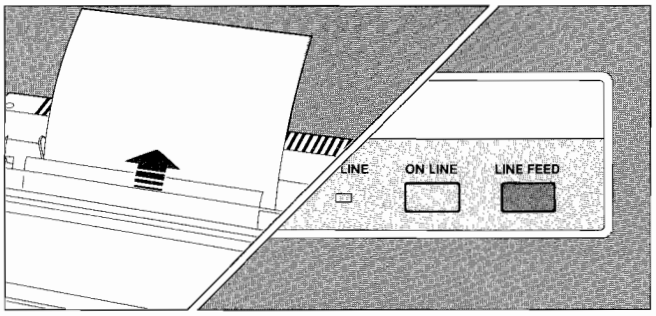
3. If your printer is a serial version, set DIP switches installed behind the control panel.



4. Connect the printer to the host computer.
5. Connect the power cord to the printer and insert the plug end into the outlet.
6. Power on the host computer.



7. Power on the printer. Make sure that "POWER" and "ON LINE" lamps come on.

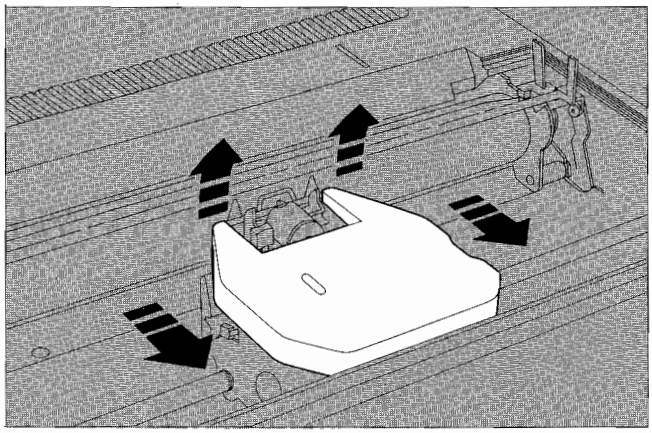


8. Load the paper by using the LINE FEED Switch. Now the printer is ready for printing.

Notes:

- *Be sure to power on the printer after turning on the host computer, and power off the printer before turning off the host computer.*
- *Be sure to turn off both of the printer and host computer before connecting or disconnecting them.*

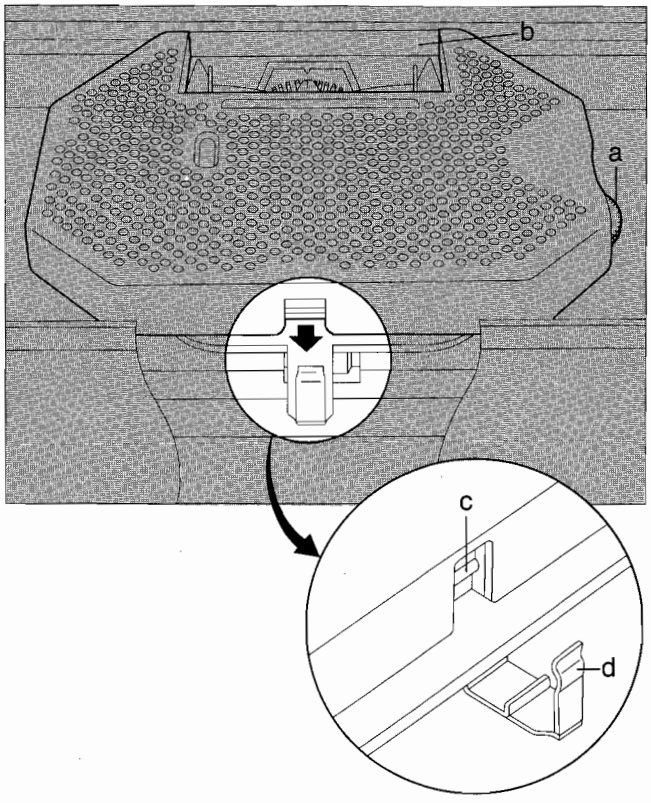
4. CASSETTE RIBBON



To replace the ribbon

The multi-strike film ribbon is provided with the printer.

1. Remove the top cover.
2. Hold the ribbon with both hands and lift it up from the front while pulling it towards you.

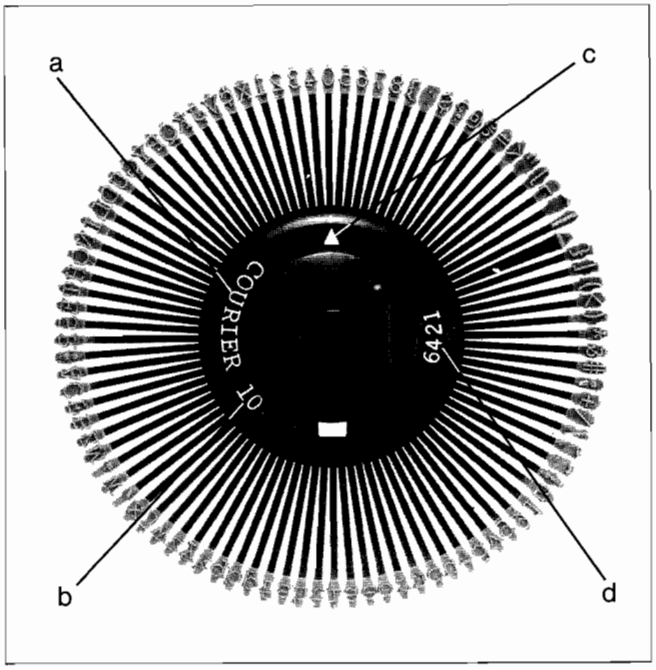


3. Turn the ribbon feed disk (a) on the new ribbon clockwise to tighten the ribbon (b).
4. Position the recess (c) of the cassette at the ribbon cassette retainer (d) on the carriage.
5. Push down the cassette until it clicks into position with ribbon tape placed between the daisy wheel and the platen.
6. Turn the ribbon feed disk 2 or 3 times in the arrow direction to remove any slack in the ribbon.
7. Reinstall the top cover.
8. Place the printer in "on line" mode by depressing the "ON LINE" switch. (See page 9.)

Notes:

- *When the ribbon is used up, the "ON LINE" lamp lights on and off, and the printer is taken "off line". In this case, set a new ribbon following the above procedures.*
- *Whenever you remove the ribbon, make sure that the printer is in the "off line" mode.*

5. DAISY WHEEL



The following indications are given on the daisy wheel:

a. Type style (standard)
COURIER

b. Typing pitch
10 — 10-character per inch

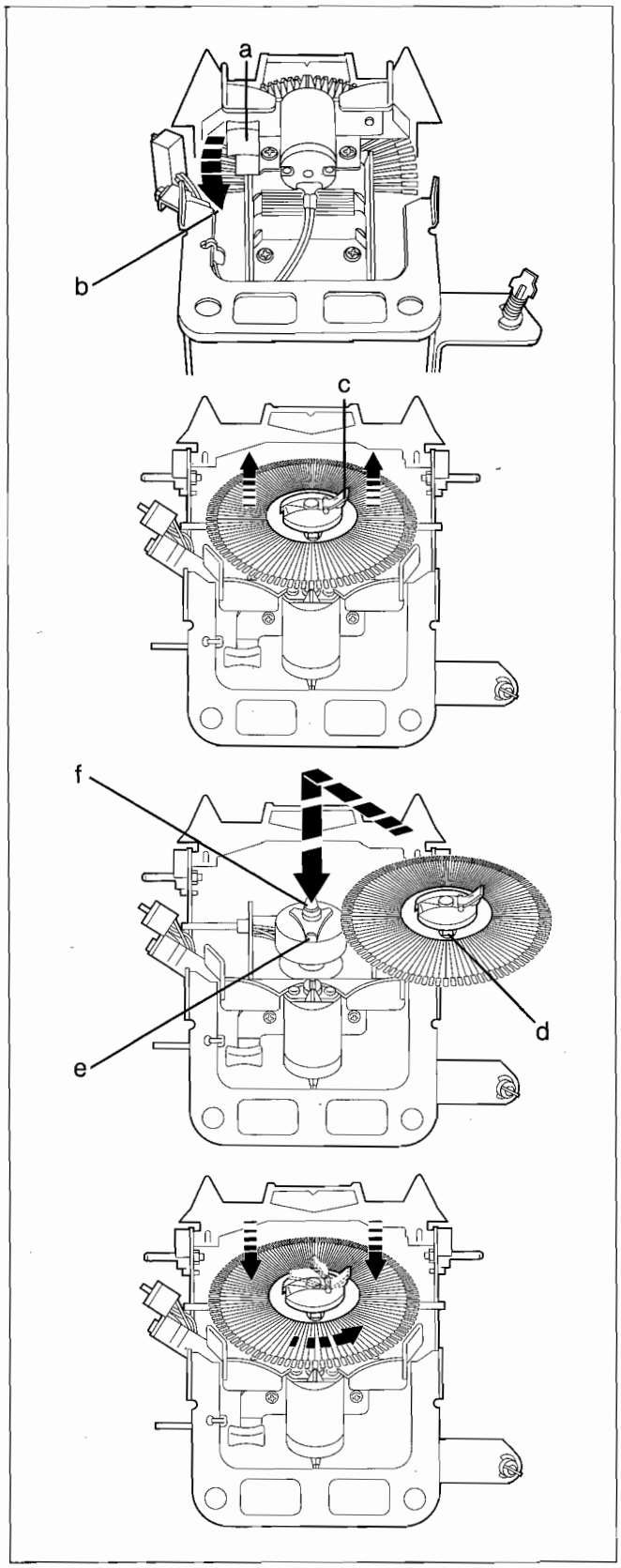
c. Symbol of typing pitch
▲ — 10-pitch

d. Code number for character arrangement 6421
(4 digits) — ASCII

Type Styles

10-pitch – 6421

```
COURIER 10
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
```



To replace the daisy wheel

1. Remove the ribbon. (See page 5.)
2. Hold the red lever (a) and pull it to tilt the daisy wheel holder unit (b) towards you.

3. Open the lever (c) in the center of the daisy wheel until it clicks, and then remove the daisy wheel.

4. Open the lever in the center of the daisy wheel of your choice and align the slot (d) of the daisy wheel with the daisy wheel holder (d) and mount the daisy wheel onto the guide pin (f).

5. Close the lever by pushing it with a forefinger until it CLICKS into position.
6. Make one turn of the daisy wheel with a finger to confirm it is set properly.
7. Restore the daisy wheel holder unit to the original position using the red lever.
8. Remount the ribbon in the position. (See page 5.)

Notes:

- *When replacing the daisy wheel, be sure to turn that the printer is in "off line" mode.*
- *Do not turn the power switch on before the daisy wheel is mounted.*

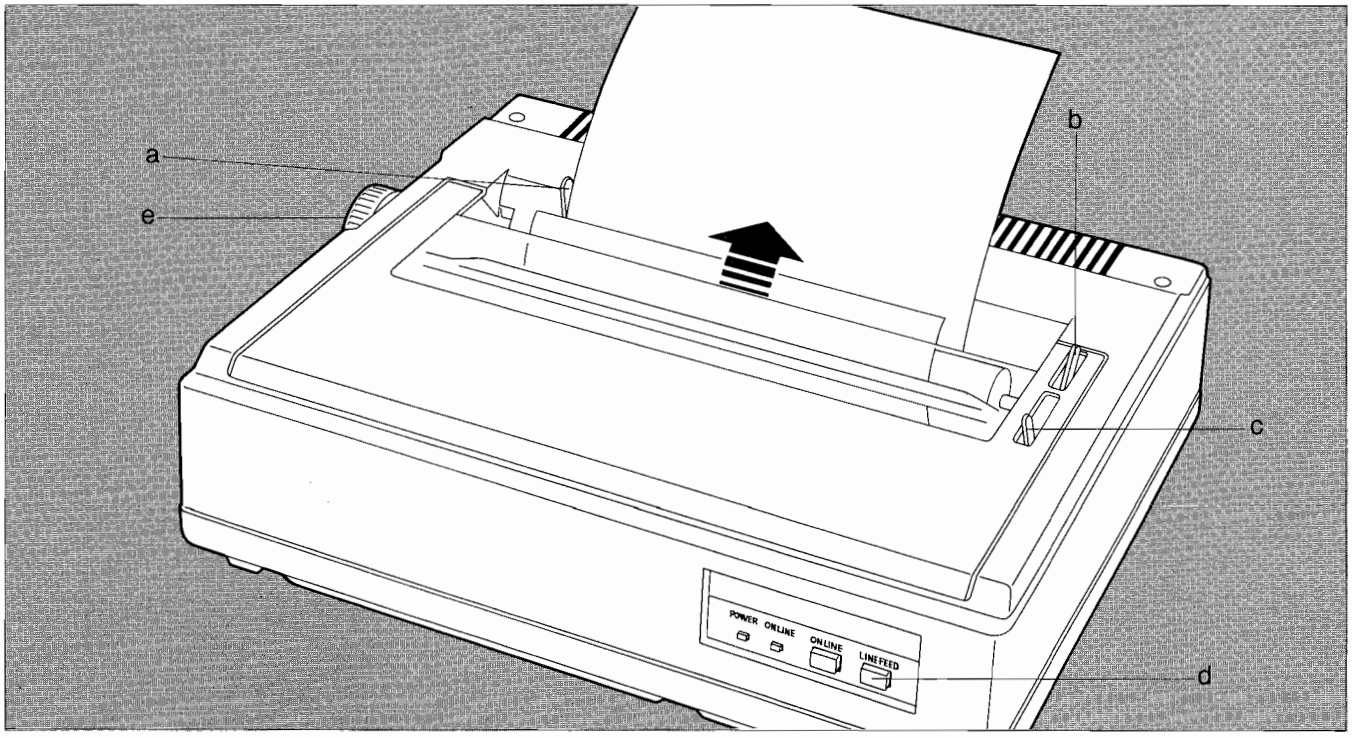
6. PAPER SETTING

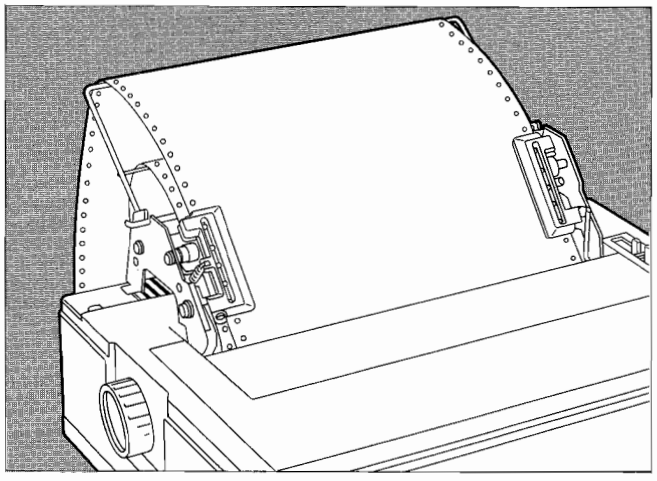
1. Align the left edge of the paper with the paper guide (a) and insert the paper behind the platen.
2. Pull the paper bail lever (c) towards you.
3. Continue to depress the LINE FEED switch (d) on the control panel to send the paper to your desired first printing line.
4. Return the paper bail lever to its original position.
5. If the adjustment of the paper is required, use the paper release lever (b), paper bail lever (c), and platen knob (e).

Paper Release Lever
Pull the lever (b) towards you, and the paper will be released to move freely.

Paper Bail Lever
Pull the lever (c) towards you, and the paper bail will be released from the platen to make it easy to insert or adjust the paper.

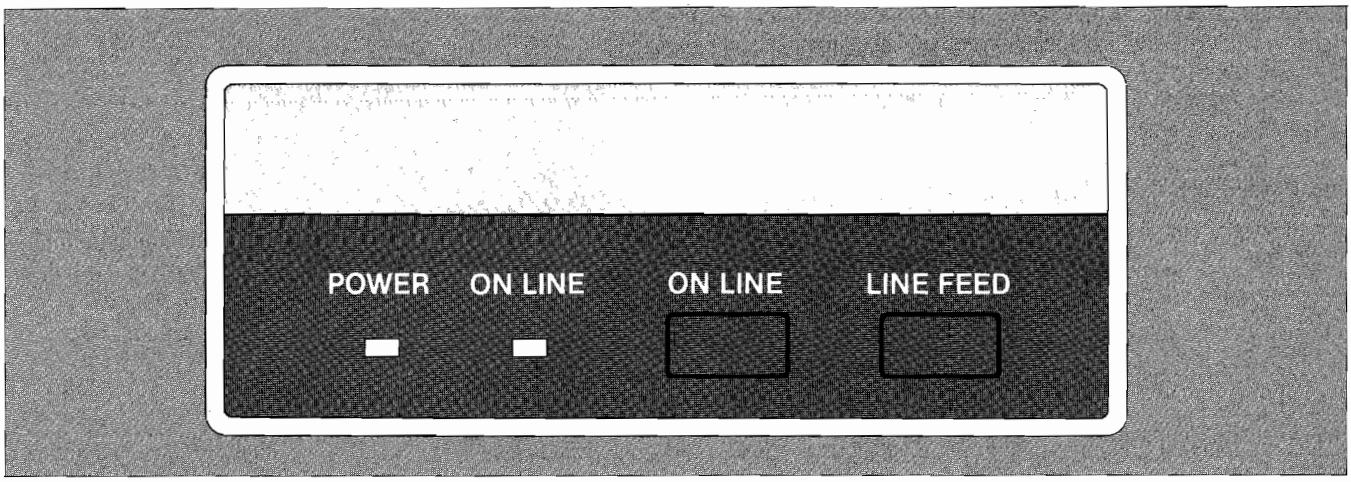
Platen Variable
Turn the left platen knob (e) while pushing it in. You can rotate the platen freely and set the paper at any line regardless of the set line spacing.





Form Tractor (Option)
The optional form tractor allows you to use computer output paper on this printer.

7. CONTROL PANEL



Switches

(1) ON LINE
Depressing the "ON LINE" switch toggles the printer between the two states of "on line" and "off line". The present condition is indicated by the "ON LINE" lamp.

(2) LINE FEED
Depressing the "LINE FEED" switch causes a one-line (1/6 inch) paper feed. Continuous pressure on this switch results in continuous paper feed.

Lamps

(1) POWER
The "POWER" lamp is lit when the power switch is on.

(2) ON LINE
The "ON LINE" lamp indicates that the printer is ready for printing. It is extinguished when the printer is taken "off-line" by means of depressing the "ON LINE" switch.

When the ribbon is used up or not installed, the "ON LINE" lamp lights on and off, and tells you to set the ribbon.
After setting the ribbon, depress the "ON LINE" switch. The printer becomes ready for printing.

Auto Line Feed

This printer does not perform a line feed with a CR code.
Power on the printer with the LINE FEED switch depressed if you wish the printer to perform a line feed following the carriage return with the receipt of a CR.

Print Mode Selection

This printer provides serial and line print modes. The two modes can be selected in the following way:

A. Serial Print Mode
Power on the printer without depressing the ON LINE switch. The printer is then set to the serial print mode. The printer prints the characters immediately after their reception from the computer.

B. Line Print Mode
Power on the printer depressing the ON LINE switch. The printer is set to the line print mode. The received data is put in a buffer and printed on the receipt of a CR, LF, or FF code. In this mode, the printer automatically prints bidirectionally.
Some control codes are not available in line print mode. See page 10.

8. CODES AND FUNCTIONS

The control codes available on this printer are listed below. ("X" means "available".) Note that some codes cannot be used in the line print mode. BASIC programs are provided in the Appendix A as the input sample of ESC codes.

8-1 Code/Function Table

CODE	FUNCTION	SERIAL PRINT MODE	LINE PRINT MODE
BS	Backspace	X	
CR	Carriage Return	X	X
ESC 1	Set Horizontal Tab	X	
ESC 2	Clear All Tab Stops	X	
ESC 3	Graphics Mode On	X	
ESC 4	Graphics Mode Off	X	
ESC 5	Forward Print On	X	
ESC 6	Backward Print On	X	
ESC 8	Clear Individual Tab Stop	X	
ESC 9	Set Left Margin	X	
ESC D	Negative Half-Line Feed	X	X
ESC U	Half-Line Feed	X	X
ESC E	Auto Underscore On	X	X
ESC R	Auto Underscore Off	X	X
ESC O	Bold Print On	X	X
ESC &	Bold Print Off	X	X
ESC Y	Print 20 Hex (See the Coade Table in Appendix C.)	X	X
ESC Z	Print 7F Hex (See the Coade Table in Appendix C.)	X	X
ESC LF	Negative Line Feed	X	
ESC "	Auto LF On	X	X
ESC #	Auto LF Off	X	X
ESC /	Turn To Line Print Mode	X	
ESC \	Turn To Serial Print Mode		X
ESC HT n	Absolute Horizontal Tab	X	
ESC VT n	Absolute Vertical Tab	X	
ESC RS n	Set Vertical Motion Index (VMI)	X	X
ESC US n	Set Horizontal Motion Index (HMI)	X	
ESC FF n	Set Form Length	X	X
ESC CR P	Initial Remote Reset	X	
FF	Form Feed	X	X
HT	Horizontal Tab (normal)	X	
LF	Line Feed	X	X
SP	Space	X	X

8-2 Explanation of Functions

BS (08H)	Back Space Moves the carriage in the direction opposite to the printing direction by one character.
CR (0DH)	Carriage Return A. Serial Print Mode 1. Moves the carriage to the left margin and prints the following data. 2. Cancels the backward direction printing mode and the graphics mode. B. Line Print mode Causes the data stored in the buffer to be printed.
ESC 1 (1BH, 31H)	Set Horizontal Tab Stop Sets the horizontal tab at the current carriage position.
ESC 2 (1BH, 32H)	Clear All Tab Stops Clears all the tab stops simultaneously irrespective of the carriage position.
ESC 3 (1BH, 33H)	Graphics Mode On Puts the printer in the graphics mode. In the graphics mode, the carriage will not move even if a character is printed. Moving the carriage requires the operation of tab, space, back space or line feed. In the graphics mode, the space (SP) and back space (BS) are fixed to 1/60 inch while line feed (LF) and negative line feed (ESC LF) performs a 1/48 inch paper feed. The graphics mode is cancelled by the input of ESC 4 or CR.
ESC 4 (1BH, 34H)	Graphics Mode Off Clears the graphics mode. When the printer exits the graphics mode with ESC 4 and comes back to the normal print mode, auto underscore (ESC E) and bold print (ESC O) commands which had been set before entering the graphics mode, will not be restored.
ESC 5 (1BH, 35H)	Backward Printing Off Cancels the backward printing mode.
ESC 6 (1BH, 36H)	Backward Printing On Printer performs printing in backward direction (right to left). In this mode SP moves the carriage to the left and BS to the right. The backward printing mode is cancelled by ESC 5 or CR.
ESC 8 (1BH, 38H)	Clear the Individual Tab Stop. Clears the individual tab stop by inputting this code after the carriage has been moved to the tab stop by normal tab performance (HT). If there are no further pre-set tabs to the right of the printing position, the HT code will not move the carriage.
ESC 9 (1BH, 39H)	Set Left Margin Sets the left margin at the current carriage position.
ESC D (1BH, 44H)	Negative Half-Line Feed A. Serial Print Mode Feeds the paper downward by half of the amount specified by ESC RS n. In case the line feed spacing pitch is an odd number of 1/48-inch increments, the remainder is ignored. B. Line Print Mode Feeds the paer 1/12 inch downward. This command is convenient for superscript. (e.g. $5^2 = 25$) It is not possible to use this code successively for negative paper feeding.

ESC U (1BH, 55H)	Half-Line Feed A. Serial Print Mode Feeds the paper upward by half of the amount specified by ESC RS n. In case the line feed spacing pitch is an odd number of 1/48-inch increments, the remainder is ignored. B. Line Print Mode Feeds the paper 1/12 inch upward. This command is convenient for subscript. (eg. H_2O) See page 26. It is not possible to use this code successively for paper feeding.
ESC E (1BH, 45H)	Auto Underscore On Underscores a character or space. See page 25.
ESC R (1BH, 52H)	Auto Underscore Off Clears the auto underscore printing mode. See page 25.
ESC O (1BH, 4FH)	Bold Print On Carries out bold print by printing the character, shifting 1/120 inch, then printing the character once more. This mode is cancelled by ESC & or CR. See page 25.
ESC & (1BH, 26H)	Bold Print Off Clears bold print mode. See page 25.
ESC Y (1BH, 59H) ESC Z (1BH, 5AH)	Print HEX20 and HEX7F Used for printing two characters not included in the 94-character ASCII code. As for the characters to be printed, see the code table of your daisy wheel number. (eg. ESC Y prints "¢", and ESC Z prints "¬" in daisy wheel No. 642.)
ESC LF (1BH, 0AH)	Negative Line Feed Feeds the paper by one line (1/48 inch × VMI) downward. Line feed amount is 1/6 inch when not specified by ESC RS n. In the graphics mode, it is set at 1/48 inch.
ESC " (1BH, 22H)	Auto Line Feed On After this code is received, printer executes one line feed following the carriage return every time it receives CR (0DH).
ESC # (1BH, 23H)	Auto Line Feed Off Cancels the auto line feed mode.
ESC / (1BH, 2FH)	Turn to Line Print Mode Changes the printing mode from the serial print to the line print. This code initializes the printer except the auto line feed mode if it has been set. See the "RESET OF THE PRINTER" section on page 15.
ESC \ (1BH, 5CH)	Turn to Serial Print Mode Changes the printing mode from the line print to the serial print. This code initializes the printer except the auto line feed mode if it has been set. See the "RESET OF THE PRINTER" section on page 15.
ESC HT n (1BH, 09H, n)	Absolute Horizontal Tab Makes it possible to move the carriage to any desired print position without presetting the tab. Tab position can be set by specifying the value of "n". The "n" is the number of characters counted from the left final position and cannot exceed 126. (Example) Tab position / n / Input by ASCII codes / Input by Hex. Print position No.5 / 5 / ESC HT ENQ / 1BH, 09H, 05H Print position No.50 / 50 / ESC HT 2 / 1BH, 09H, 32H Print position No.80 / 80 / ESC HT P / 1BH, 09H, 50H This command is also effective in the graphics mode.

ESC VT n (1BH, 0BH, n)

Absolute Vertical Tab
Feeds the paper to any of the first 126 lines.
Unlike the horizontal tab, there is only one method of vertical tabbing, that is an absolute vertical tab. Tab position cab be set by specifying the value of "n". The "n" is the line number counted from the TOF SET position.

(Example)

Tab position	n	Input by ASCII codes	Input by Hex.
Line No.5	5	ESC VT ENQ	1BH, 0BH, 05H
Line No.33	33	ESC VT !	1BH, 0BH, 21H
Line No.50	50	ESC VT 2	1BH, 0BH, 32H

It is possible to feed the paper to a line beyond the page boundary. The paper feed thereafter is conducted from the TOF SET position of that page.

ESC RS n (1BH, 1EH, n)

Set Vertical Motion Index (Set Line Feed Amount)
Line feed amount can be set by specifying the value of "n" in the following formula.

$$\text{Line feed amount} = 1/48 \text{ inch} \times (n-1)$$

(Example)

Line feed amount	n	Input by ASCII code	Input by Hex.
0 (No line spacing)	1	ESC RS SOH	1BH, 1EH, 01H
1/12 inch	5	ESC RS ENQ	1BH, 1EH, 05H
1/6 inch	9	ESC RS HT	1BH, 1EH, 09H
1/4 inch	13	ESC RS CR	1BH, 1EH, 0DH
1/3 inch	17	ESC RS DC1	1BH, 1EH, 11H

See page 24.

The value of "n" cannot exceed 126.
When "ESC RS n" code is not input, the amount of line feed is automatically set to 1/6 inch at power on.
Note:
The value of (n – 1) is called "VMI" (Vertical Motion Index). Refer to Appendix B.

ESC US n (1BH, 1FH, n)

Set Horizontal Motion Index (Set Horizontal Spacing Pitch)
Horizontal spacing pitch of the carriage can be set by specifying the value of "n" in the following formula.

$$\text{Spacing pitch} = 1/120 \text{ inch} \times (n-1)$$

(Example)

Spacing amount	n	Input by ASCII code	Input by Hex.
1/15 inch	9	ESC US HT	1BH, 1FH, 09H
1/12 inch	11	ESC US VT	1BH, 1FH, 0BH
1/10 inch	13	ESC US CR	1BH, 1FH, 0DH

The value of (n – 1) is called "HMI" (Horizontal Motion Index).
Refer to Appendix B.

<table>
<tr><td>ESC FF n (1BH, 0CH, n)</td><td>Set Form Length
Form length can be set by specifying the value of "n" in the following formula.
Form length=Line feed amount × "n"
The value of "n" cannot exceed 126.
When the printer receives FF(0CH) code, it feeds paper to the TOF SET position on the next page if the form length has been correctly set. When ESC FF n is not used, form length is set to 11 inches at power on.

(Example)
When the line feed amount is 1/6 inch.
<table>
<tr><th>Form length you wish to set</th><th>n</th><th>Input by ASCII code</th><th>Input by Hex.</th></tr>
<tr><td>8 inches</td><td>48</td><td>ESC FF 0</td><td>1BH, 0CH, 30H</td></tr>
<tr><td>11 inches</td><td>66</td><td>ESC FF B</td><td>1BH, 0CH, 42H</td></tr>
<tr><td>12 inches</td><td>72</td><td>ESC FF H</td><td>1BH, 0CH, 48H</td></tr>
<tr><td>15 inches</td><td>90</td><td>ESC FF Z</td><td>1BH, 0CH, 5AH</td></tr>
</table></td></tr>
<tr><td>ESC CR P (1BH, 0DH, 50H)</td><td>Initial Remote Reset
This code resets the printer in the same manner as the power on. Refer to "RESET OF THE PRINTER" on page 15.</td></tr>
<tr><td>FF (0CH)</td><td>Form Feed
A. Serial Print Mode
Feeds the paper to the TOF SET position on the next page.
B. Line Print Mode
Feeds the paper to the TOF SET position on the next page after printing the current line.</td></tr>
<tr><td>HT (09H)</td><td>Horizontal Tab
Moves the carriage to a preset tab position on the right.</td></tr>
<tr><td>LF (0AH)</td><td>Line Feed
A. Serial print mode
Feeds the paper by one line (1/48 inch × VMI) upward.
B. Line print mode
Feeds the paper by one line upward after printing the current line. Data following LF code are printed bidirectionally.</td></tr>
<tr><td>SP (20H)</td><td>Space
Spaces the carriage by one selected pitch in the present printing direction.</td></tr>
</table>

Note:

•In line print mode, a CR, LF, or FF code acts as a print command code printing data stored in the one-line buffer.

SILVER REED

SILVER-REED AMERICA, INC.
19600 South Vermont Avenue
Torrance, California 90502, U.S.A.

Thank You for your purchase of a **Silver-Reed** Printer. The following information concerning support for your Silver-Reed Printer, as well as accessories available to you, is provided for your convenience.

INSTALLATION

Should you encounter problems with the installation/operation of your Silver-Reed Printer, please take the following steps:

1. Consult your Operators Manual to be certain that your Printer was prepared correctly for your particular operation. If, after careful investigation of your problem utilizing the Operators Manual, your problem cannot be resolved, then:
2. Contact your Salesman/Dealer. If, after you have discussed the nature of your problem with your Salesman/Dealer, your problem is still not resolved, then:
3. Contact Silver-Reed. Product Support may be contacted at one of the following toll-free numbers:
   Outside California: (800)421-4191
   Inside California: (800)252-7760

ACCESSORIES

The following supplies and accessories are listed for your general information and are currently available from your Salesman/Dealer unless otherwise noted:

PRODUCT CODE NO.	DESCRIPTION
■TYPE WHEELS (Compatible with Silver-Reed Typewriter Wheels)	
6421	Courier 10-10 pitch
6422	Courier 12-12 pitch
6423	Gothic Mini-15 pitch
6424	Modern-Proportional Spacing
(Examples of print style attached)	
■RIBBONS (Compatible with Olivetti ET Series Cartridges)	
5503	Fabric (M/Strike)
5504	One-Time Film
5505	Multi-Strike Film
■ADDITIONAL ACCESSORIES	
Form Tractor FT420	Tractor Feed Assembly for EXP420
Form Tractor FT800	Tractor Feed Assembly for EXP600/800
Cut Sheet Feeder CF131	Single Cut Sheet Feeder for EXP600/800
Interface Connector for Centronics parallel	Three types of interface can be selected on EXP600/800 by changing the connector.
Interface Connector for RS232C serial	
Interface Connector for IEEE-488	
40KB Buffer	Expands the print buffer to 40KB for EXP600/800
9KB Buffer	Expands the print buffer to 9KB for EXP600/800

WORD PROCESSOR USERS: The EXP420/600/800 emulates the Diablo 630.**

We trust this information will facilitate and enhance the use and pleasure of your **Silver-Reed** Printer.

**Diablo is a trademark of XEROX Corporation.

Printed in Japan T9637(B)

ASCII TYPE STYLES

COURIER 10

Product Code#6421

10 PITCH

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890\~{}¢`=+-[]()
!@#$%^&*_'":;?/|<>,.¬

The Silver-Reed line of fully electronic typewriters and printers, featuring the interchangeable type wheels, are unsurpassed in performance, versatility and dependability. Silver-Reed Electronics - the state of the art in solid state.

COURIER 12

Product Code#6422

12 PITCH

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890\~{}¢`=+-[]()
!@#$%^&*_'":;?/|<>,.¬

The Silver-Reed line of fully electronic typewriters and printers, featuring the interchangeable type wheels, are unsurpassed in performance, versatility and dependability. Silver-Reed Electronics - the state of the art in solid state.

GOTHIC MINI

Product Code#6423

15 PITCH

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890\~{}¢`=+-[]()
!@#$%^&*_'":;?/|<>,.¬

The Silver-Reed line of fully electronic typewriters and printers, featuring the interchangeable type wheels, are unsurpassed in performance, versatility and dependability. Silver-Reed Electronics - the state of the art in solid state.

MODERN

Product Code#6424

Proportional Spacing

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890\~{}¢`=+-[]()
!@#$%^&*_'":;?/|<>,.¬

The Silver-Reed line of fully electronic typewriters and printers, featuring the interchangeable type wheels, are unsurpassed in performance, versatility and dependability. Silver-Reed Electronics - the state of the art in solid state.

9. RESET OF THE PRINTER

(1) When the printer is powered on,
(2) When the $\overline{\text{PRIME}}$ signal is received, or
(3) When the ESC CR P is received (in serial print mode only)

The printer is reset to the following conditions:

(1) Carriage moves to the left final position.
(2) Printing is in the forward direction.
(3) Top of Form (first printing line) is set to the present priting line.
(4) Line feed amount is set to 1/6 inch (6 lines per inch).
(5) Form length is set to 11 inches.
(6) Auto underscore off
(7) Bold print off
(8) Auto line feed off

10. PARALLEL INTERFACE

10-1 Explanation of Signals and Specifications

PIN NO.	SIGNAL	IN/OUT	DESCRIPTION
1	$\overline{\text{STROBE}}$	IN	Used to strobe (clock) the read data into the printer. The pulse width must be greater than 0.5μs when received at the printer. This signal is normally "HIGH" and data is read into the printer when the signal goes "LOW".
2 3 4 5 6 7 8	Data Bit 1 Data Bit 2 Data Bit 3 Data Bit 4 Data Bit 5 Data Bit 6 Data Bit 7	IN IN IN IN IN IN IN	Data bits 1 through 7 represent the 1st (MSB) to 7th (LSB) bits of the ASCII "word" (character or command) to be executed by the printer (positive logic).
9	Data Bit 8	IN	This bit is ignored.
10	$\overline{\text{ACK}}$	OUT	A pulse of approx. 10μs. When this signal is "LOW", it indicates that the printer has received data and is ready to receive more data.
11	BUSY	OUT	When this signal is "HIGH" it indicates that the printer cannot receive data. This signal will go "HIGH" upon the following conditions: a) While data is being accepted. b) During a printing operation. c) When the printer is taken "off line" mode. d) When the ribbon is used up or not installed, or it is entangled with the daisy wheel.
12	ALERT	OUT	This signal goes "HIGH" when the ribbon is used up or not installed.
13	SELECT	OUT	This signal goes "HIGH" when the printer is taken "on line" mode.
14			Not used.

PIN NO.	SIGNAL	IN/OUT	DESCRIPTION
15			Not used.
16	ØV		Logic ground
17	CHASSIS GROUND		Not used.
18			+5V (See note 1.)
19 thru. 30			Twisted Pair Ground
31	$\overline{\text{PRIME}}$	IN	This signal, also known as $\overline{\text{INIT}}$, when "LOW", resets the printer to its initial "Power-on" state. This signal must be kept "HIGH" when the printer is in normal operation. The pulse width of this signal must always exceed 50μs at the printer input.
32	$\overline{\text{FAULT}}$	OUT	This signal will go "LOW" if the ribbon is entangled with the daisy wheel or operation is attempted without the daisy wheel in place.
33			Not used.
34			Not used.
35	$\overline{\text{FUSE}}$	OUT	This signal goes "LOW" when the voltage drops inside the printer. (+5V in normal condition) (See note 2.)
36			Not used.

Notes:

1. No more than 5mA may be drawn from pin 18.

2. This signal does not go "LOW" when it is pulled up to +5V by host CPU.

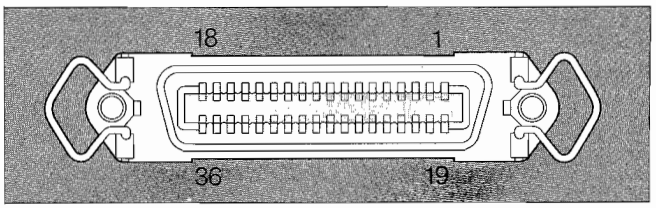
Applicable connectors

Plug (on cable side) Amphenol 57-30360 or equal

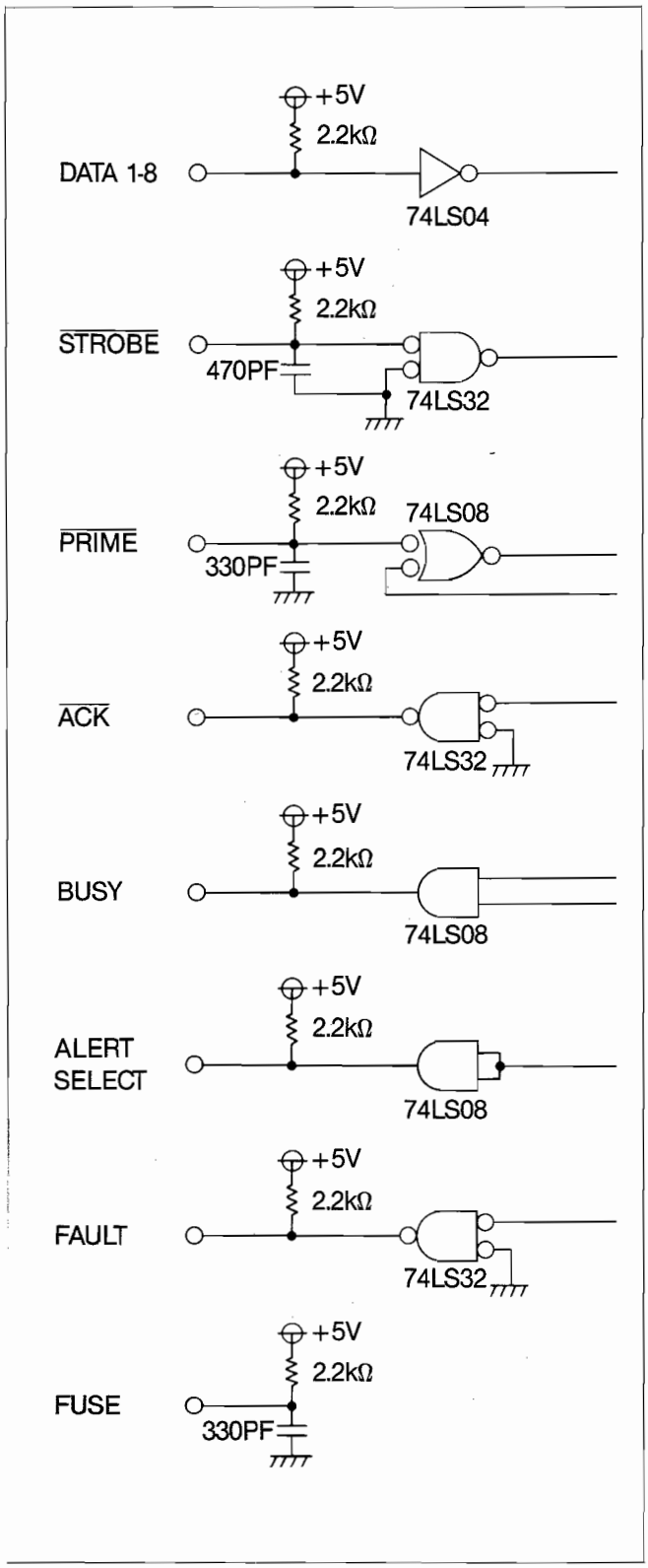
Receptacle: (on printer side)

Amphenol 57-40360 or equal

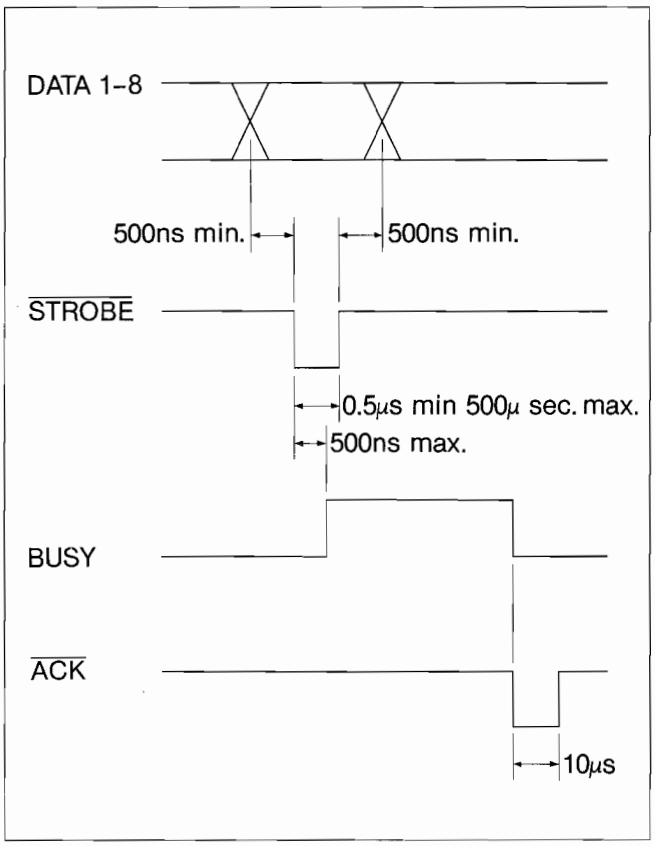
View on receptacle from connector cable side.



10-2 Input/Output Circuits



10-3 Timing Chart



11. SERIAL INTERFACE (RS232C)

This section is concerned with a serial version of the printer. To set up the printer for your particular computer, appropriate setting of DIP switches and Jumpers are required. When the printer does not work properly with your computer, please consult with an authorized service engineer.

11-1 Specifications

Type	Based on EIA RS232C
Buffer capacity	2048 Bytes
Synchronous system	Asynchronous system
Protocol	READY/BUSY system
	Xon/Xoff system
	ETX/ACK system
Transmission rate	9600 Baud
	4800 Baud
	2400 Baud
	1200 Baud
	600 Baud
	300 Baud
Parity	Even number
	Odd number
	No-parity
Data bit	8 bits
	7 bits
Stop bit	1 bit
	2 bits
Used LSI	USART (Equivalent for Intel 8251)

11-2 Protocol

One of the following three protocols can be selected as the data transfer method between the printer and the host computer. Select the protocol by the setting of DIP switch SW1 and jumpers.

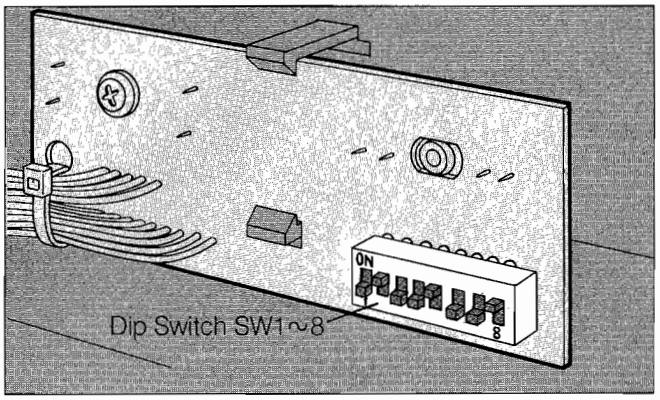
1) READY/BUSY system
2) Xon/Xoff system
3) ETX/ACK system

(1) READY/BUSY system
The printer is provided with 2048-byte data buffer. When the remaining capacity of the buffer comes to 32 bytes, the printer sends a BUSY signal to the host computer.
When the remaining data in the buffer is 31 bytes or less, a READY signal is sent to the host computer.
A READY/BUSY signal can be sent through RTS line (Pin No.4) or DTR line (Pin No.20) by jumper setting.

(2) Xon/Xoff system
When the remaining capacity of the data buffer comes to 32 bytes, an Xoff (13H) is sent to the host computer on the TD signal line. When the remaining data in the buffer is 31 bytes or less, an Xon (11H) is sent to the host computer.

(3) ETX/ACK system
Under this system the host computer sends a series of data with ETX (End of Text, 03H) at the end of the data. When the printer reads the ETX, it sends ACK (Acknowledge, 06H) to the host on the TD signal line, thus requesting more data. The ETX code must be inserted in every data quantity not exceeding the buffer capacity.

11-3 DIP Switch



DIP switches (SW1-SW8) are installed under the top cover behind the control panel. Set the switches before you power on the printer. The asterisks (*) in the following tables indicate the factory setting.

(1) SW1: Protocol
This switch selects the protocol between the Xon/Xoff system and the ETX/ACK system along with the jumper setting on the main board. (See page 20.)

SW1	Protocol
OFF*	Xon/Xoff
ON	ETX/ACK

The READY/BUSY signal is sent to the host computer irrespective of the setting of SW1. Those signals are sent through RTS (Pin No.4) or DTR (Pin No.20) according to the setting of jumpers shown on page 20.

(2) SW2 and SW3: Parity

These switches select the parity bit for the transmission data (Xon, Xoff, ACK) from the printer. This printer does not carry out parity check for the received data.

SW2	SW3	Parity
OFF	OFF	Even number parity
OFF	ON	Odd number parity
ON*	OFF* or ON	Without parity

(3) SW4: Data Length

This switch selects the number of bits for one character.

SW4	Bit
OFF*	8 bits
ON	7 bits

(4) SW5: Stop bit

This switch selects the number of stop bits for the transmission or received data.

SW5	Bit
OFF	2 bits
ON*	1 bit

(5) SW6, SW7 and SW8: Baud rate

These switches select the data transmission speed.

SW6 OFF*		SW6 ON		Baud rate
SW7	SW8	SW7	SW8	
OFF	OFF	—	—	300 baud
ON	OFF	—	—	600 baud
OFF*	ON*	OFF	OFF	1200 baud
ON	ON	ON	OFF	2400 baud
—	—	OFF	ON	4800 baud
—	—	ON	ON	9600 baud

11-4 Interface Connector

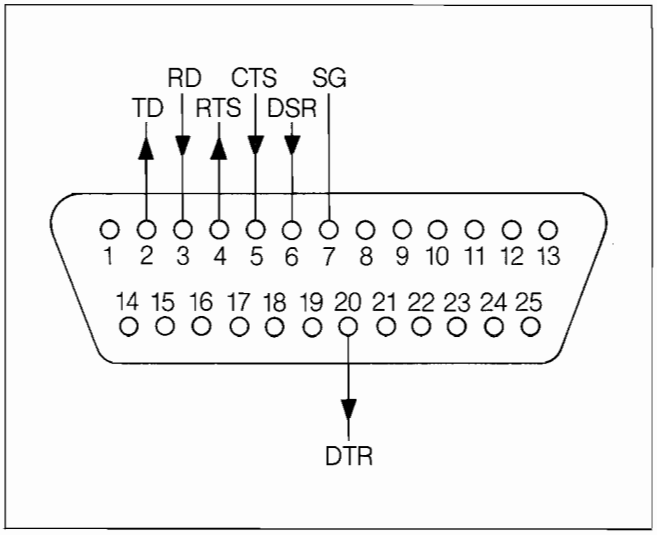
(1) Connector Pin Assignment

Pin No.	Name	Description
2	TD	Transmitted Data
3	RD	Received Data
4	RTS	Request To Send
5	CTS	Clear To Send
6	DSR	Data Set Ready
7	SG	Signal Ground
20	DTR	Data Terminal Ready

(2) Applicable Connector

Plug (Cable side): DB-25PT (JAE) or equivalent
Connector (Printer side): DB-25ST (JAE) or equivalent

Fig. 1 Applicable Connector



11-5 Jumper Setting

Jumper pins are located on the main board. Jumpers have been preset on jumper pins No.1, No.3, No.5, and No.8 at factory. When you are required to change the setting, consult with an authorized service engineer. Special tools are needed to reach the jumper pins.

Fig. 1 Jumper Pins

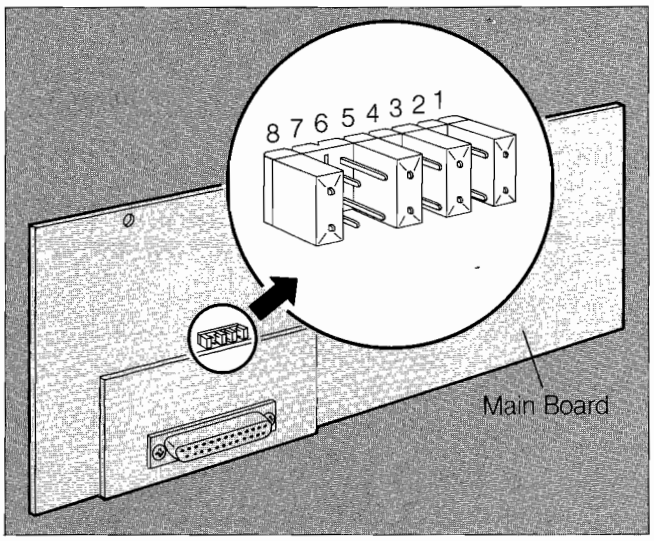
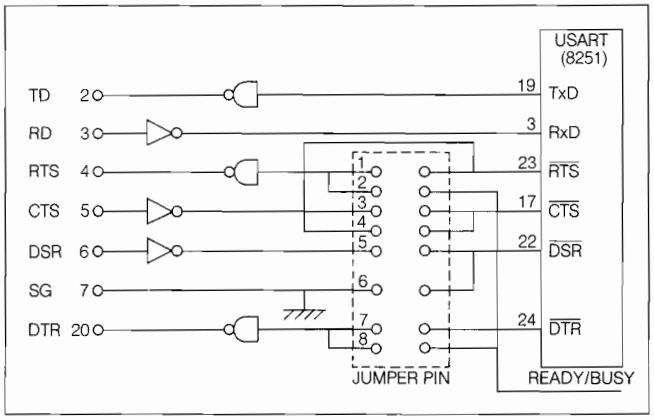


Fig. 2 Serial I/O Circuit



11-6 Control Signals

(1) TD (Transmitted Data) — Pin No.2
Transmission line for data sent from the printer to the host computer.

(2) RD (Received Data) — Pin No.3
Transmission line for data sent from the host computer to the printer.

(3) RTS (Request to Send) — Pin No.4
This line is used for requesting the host computer to send data.

a) Set a jumper to No.2 to send a READY/BUSY signal through this line.
When the printer is "READY", RTS is "HIGH". When the printer is "BUSY", RTS is "LOW".

b) When you select the Xon/Xoff system, ETX/ACK system, or the READY/BUSY through DTR (Pin No.20), set the jumper to No.1. In this case the RTS is always "HIGH".

(4) CTS (Clear to Send) — Pin No.5
When this line is "HIGH", it shows that the host computer is ready to receive data from the printer.
The pin 17 of USART (8251) is required to be "LOW" so that the printer can send the data. When the host computer uses this CTS line, set a jumper to No.3 and when it does not use, set to No.4.

(5) DSR (Data Set Ready) — Pin No.6
This printer ignores this line. Therefore, it does not care whether a jumper is set to No.5 or No.6.

(6) SG (Signal Ground) — Pin No.7
Ground line for signal.

(7) DTR (Data Terminal Ready) — Pin No.20
When this line is "HIGH", it indicates that the printer is ready to receive data from the host computer.

a) When you select the READY/BUSY through DTR, not through RTS (Pin No.4), set a jumper to No.8. In this case it is prohibited to set a jumper to No.2 simultaneously.

b) When you select the Xon/Xoff system, ETX/ACK system, or the READY/BUSY through RTS, set a jumper to No.7. In this case, DTR is always "HIGH".

APPENDIX A Sample BASIC Programs

The commands used in the following BASIC programs may differ from those of your computer. In that case refer to your BASIC manual and modify the program.

(1) Left Margin Setting
Codes: ESC 9 (Set Left Margin)

```
10 LPRINT "LEFT MARGIN:10":LPRINT
20 LPRINT "0";SPC(9);
30 LPRINT "10";SPC(8);
40 LPRINT "20"
50 LPRINT SPC(10);
60 LPRINT CHR$(27);CHR$(57)
70 LPRINT "ABCDEFGHIJKLMNOPQRSTUVWXYZ"
80 LPRINT "ABCDEFGHIJKLMNOPQRSTUVWXYZ"
90 END
```

```
LEFT MARGIN:10

0         10        20

          ABCDEFGHIJKLMNOPQRSTUVWXYZ
          ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

(2) Tab Setting and Tab Clear
Codes: ESC 1 (Set Horizontal Tab)
ESC 8 (Clear Individual Tab Stop)

```
10 FOR N=1 TO 4
20 LPRINT "0123456789";
30 NEXT
40 LPRINT
50 FOR N=1 TO 3
60 LPRINT SPC(10);CHR$(27);"1";
70 NEXT
80 LPRINT
90 LPRINT CHR$(9);"X";CHR$(9);"X";CHR$(9);"X"
100 LPRINT CHR$(9);CHR$(9);CHR$(27);"8"
110 LPRINT CHR$(9);"X";CHR$(9);"X"
120 END
```

```
0123456789012345678901234567890123456789
        X         X         X
        X                   X
```

(3) Setting the Horizontal Spacing Pitch
Codes: ESC US n (Horizontal Motion Index)

```
10 FOR N=8 TO 15
20 LPRINT CHR$(27);CHR$(31);CHR$(N)
30 LPRINT "PRINT SAMPLE OF n=";N
40 NEXT
50 LPRINT CHR$(27);CHR$(31);CHR$(12)
60 END
```

```
PRINT SAMPLE OF n= 8
PRINT SAMPLE OF n= 9
PRINT SAMPLE OF n= 10
PRINT SAMPLE OF n= 11
PRINT SAMPLE OF n= 12
PRINT SAMPLE OF n= 13
PRINT SAMPLE OF n= 14
PRINT SAMPLE OF n= 15
```

(4) Setting the Line Feed Amount

Codes: ESC CR P (Initial Remote Reset)
ESC RS n (Vertical Motion Index)

```
10 FOR N=2 TO 8
20 LPRINT CHR$(27);CHR$(30);CHR$(N);
30 FOR K=1 TO 3
40 LPRINT "- PRINT SAMPLE OF n=";N
50 NEXT K
60 LPRINT CHR$(27);CHR$(30);CHR$(9);
70 LPRINT CHR$(10);
80 NEXT
90 END
```

```
- PRINT SAMPLE OF n= 2
- PRINT SAMPLE OF n= 2
- PRINT SAMPLE OF n= 2

- PRINT SAMPLE OF n= 3
- PRINT SAMPLE OF n= 3
- PRINT SAMPLE OF n= 3

- PRINT SAMPLE OF n= 4
- PRINT SAMPLE OF n= 4
- PRINT SAMPLE OF n= 4

- PRINT SAMPLE OF n= 5
- PRINT SAMPLE OF n= 5
- PRINT SAMPLE OF n= 5

- PRINT SAMPLE OF n= 6
- PRINT SAMPLE OF n= 6
- PRINT SAMPLE OF n= 6

- PRINT SAMPLE OF n= 7
- PRINT SAMPLE OF n= 7
- PRINT SAMPLE OF n= 7

- PRINT SAMPLE OF n= 8
- PRINT SAMPLE OF n= 8
- PRINT SAMPLE OF n= 8
```

(5) Absolute Tab

Codes: ESC CR P (Initial Remote Reset)
ESC HT n (Absolute Horizontal Tab)
ESC VT n (Absolute Vertical Tab)

```
10 LPRINT CHR$(27);CHR$(13);"P";
20 FOR N=1 TO 4
30 LPRINT "0123456789";
40 NEXT
50 LPRINT
60 FOR N=1 TO 8
70 LPRINT USING "#";N
80 NEXT
90 LPRINT CHR$(27);CHR$(9);CHR$(10);
100 LPRINT CHR$(27);CHR$(11);CHR$(5);"A";
110 LPRINT CHR$(27);CHR$(9);CHR$(20);
120 LPRINT CHR$(27);CHR$(11);CHR$(8);"B";
130 LPRINT CHR$(27);CHR$(9);CHR$(30);
140 LPRINT CHR$(27);CHR$(11);CHR$(5);"C";
150 LPRINT CHR$(27);CHR$(9);CHR$(30);
160 LPRINT CHR$(27);CHR$(11);CHR$(8);"D";
170 LPRINT CHR$(27);CHR$(9);CHR$(20);
180 LPRINT CHR$(27);CHR$(11);CHR$(5);"E";
190 LPRINT CHR$(27);CHR$(9);CHR$(10);
200 LPRINT CHR$(27);CHR$(11);CHR$(8);"F";
210 END
```

```
0123456789012345678901234567890123456789
1
2
3
4         A          E          C
5
6
7         F          B          D
8
```

(6) Auto Underscore
Codes: ESC E (Auto Underscore On)
ESC R (Auto Underscore Off)

```
10 LPRINT "SAMPLE OF ";
20 LPRINT CHR$(27);"E";
30 LPRINT "AUTO UNDERSCORE";
40 LPRINT CHR$(27);"R";
50 LPRINT " BY ESC E/R"
60 END
```

SAMPLE OF AUTO UNDERSCORE BY ESC E/R

(7) Bold Print
Codes: ESC 0 (Bold Print On)
ESC & (Bold Print Off)

```
10 LPRINT "SAMPLE OF ";
20 LPRINT CHR$(27);"O";
30 LPRINT "BOLD PRINT";
40 LPRINT CHR$(27);"&";
50 LPRINT " BY ESC O/&"
60 END
```

SAMPLE OF **BOLD PRINT** BY ESC O/&

(8) Superscripts
Codes: ESC D (Negative Half-Line Feed)
ESC U (Half-Line Feed)

```
10 LPRINT "SAMPLE OF ";
20 LPRINT CHR$(27);"D";
30 LPRINT "SUPER ";
40 LPRINT CHR$(27);"U";
50 LPRINT "SCRIPT BY ESC D/U"
60 END
```

SAMPLE OF SUPER SCRIPT BY ESC D/U

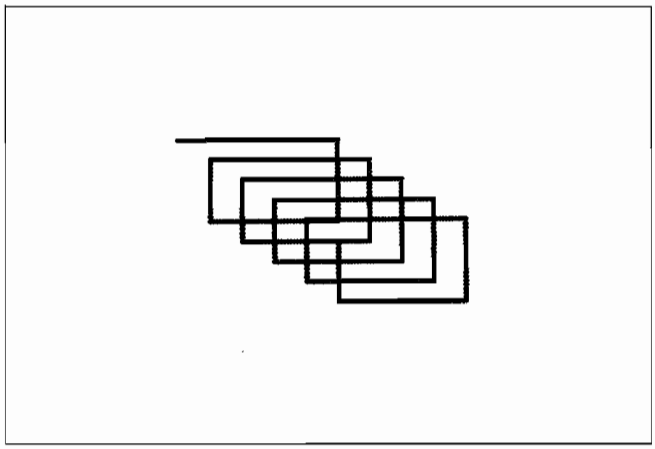
(9) Subscript
Codes: ESC U (Half-Line Feed)
ESC D (Negative Half-Line Feed)

```
10 LPRINT "SAMPLE OF ";
20 LPRINT CHR$(27);"U";
30 LPRINT "SUB ";
40 LPRINT CHR$(27);"D";
50 LPRINT "SCRIPT BY ESC U/D"
60 END
```

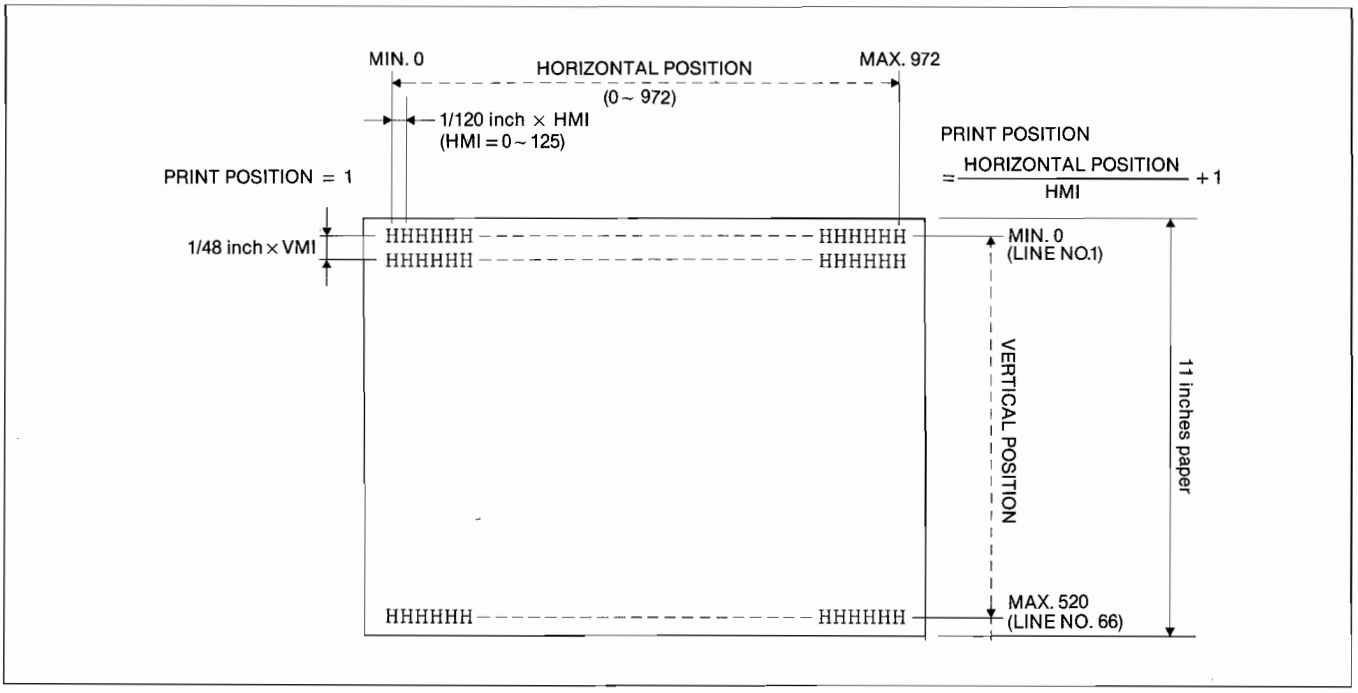
SAMPLE OF $_{\text{SUB}}$ SCRIPT BY ESC U/D

(10) Graphics Mode
Codes: ESC 3 (Graphics Mode On)

```
10 WIDTH 255
20 LPRINT CHR$(27);"3";
30 FOR M=1 TO 5
40 FOR N=1 TO 50
50 LPRINT ".";" ";
60 NEXT
70 FOR N=1 TO 20
80 LPRINT ".";CHR$(10);
90 NEXT
100 FOR N=1 TO 40
110 LPRINT ".";CHR$(8);
120 NEXT
130 FOR N=1 TO 15
140 LPRINT ".";CHR$(27);CHR$(10);
150 NEXT
160 NEXT M
170 END
```



APPENDIX B Print Format



(1) Horizontal Motion Index (HMI)
Following the printing of a character or a space, the carriage moves by 1/120 inch × HMI. HMI represents Horizontal Motion Index and is variable from a minimum of 0 (no spacing) to a maximum of 125 (125/120=1.04inch)

HORIZONTAL SPACING		
HMI	Ch./inch	Max. ch. per line
12	10	82
10	12	98
8	15	122

(2) Vertical Motion Index (VMI)
A line feed causes the paper to move by 1/48 inch × VMI. VMI represents Vertical Motion Index and is variable form a minimum of 0 to a maximum of 125.

(3) Horizontal Position
This is the value which represents the distance between the printhead and left final stop in 1/120 inch increments, ranging from a minimum of 0 to a maximum of 972 (1/120 inch × 972 = 8.1 inches).

(4) Vertical Position
This is the value which represents the distance between the current printing line and the designated first line in the corresponding page in 1/48 inch increments, ranging from a minimum of 0 to a maximum of 520 (11 inches paper).

(5) Print Position
The print position is indicated by the number calculated form the maximum left margin setting (the position the carriage goes upon power-on) to the present position of the carriage taking into consideration the pitch selected, according to the following formula:

$$\text{Print Position} = \frac{\text{Horizontal Position}}{\text{HMI}} + 1$$

The maximum left margin is always considered as position 1 and therefore the maximum print position in 10 pitch, (HMI = 12) is:

$$(972/12 + 1) = 82$$

(6) Line Number
The line number is indicated by the number calculated from the first line of the page, to the present position of the carriage, taking into consideration the line feed spacing selected. The line number, there, can be calculated as follows:

$$\text{Line Number} = \frac{\text{Vertical Position}}{\text{VMI}} + 1$$

For example, when using the standard (the default value upon power-on) 6 lines per inch spacing (VMI = 8) on 11 inches paper, the maximum number of lines would be:

$$(520/8 + 1) = 66$$

APPENDIX C Code Tables

ASCII (642)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0	NUL 0 0	DLE 10 16	SP 20 32	0 30 48	@ 40 64	P 50 80	` 60 96	p 70 112
0	0	0	1	1	SOH 1 1	DC1 11 17	! 21 33	1 31 49	A 41 65	Q 51 81	a 61 97	q 71 113
0	0	1	0	2	STX 2 2	DC2 12 18	" 22 34	2 32 50	B 42 66	R 52 82	b 62 98	r 72 114
0	0	1	1	3	ETX 3 3	DC3 13 19	# 23 35	3 33 51	C 43 67	S 53 83	c 63 99	s 73 115
0	1	0	0	4	EOT 4 4	DC4 14 20	$ 24 36	4 34 52	D 44 68	T 54 84	d 64 100	t 74 116
0	1	0	1	5	ENQ 5 5	NAK 15 21	% 25 37	5 35 53	E 45 69	U 55 85	e 65 101	u 75 117
0	1	1	0	6	ACK 6 6	SYN 16 22	& 26 38	6 36 54	F 46 70	V 56 86	f 66 102	v 76 118
0	1	1	1	7	BEL 7 7	ETB 17 23	' 27 39	7 37 55	G 47 71	W 57 87	g 67 103	w 77 119
1	0	0	0	8	BS 8 8	CAN 18 24	(28 40	8 38 56	H 48 72	X 58 88	h 68 104	x 78 120
1	0	0	1	9	HT 9 9	EM 19 25	) 29 41	9 39 57	I 49 73	Y 59 89	i 69 105	y 79 121
1	0	1	0	A	LF A 10	SUB 1A 26	* 2A 42	: 3A 58	J 4A 74	Z 5A 90	j 6A 106	z 7A 122
1	0	1	1	B	VT B 11	ESC 1B 27	+ 2B 43	; 3B 59	K 4B 75	[5B 91	k 6B 107	{ 7B 123
1	1	0	0	C	FF C 12	FS 1C 28	, 2C 44	< 3C 60	L 4C 76	\ 5C 92	l 6C 108	| 7C 124
1	1	0	1	D	CR D 13	GS 1D 29	- 2D 45	= 3D 61	M 4D 77	] 5D 93	m 6D 109	} 7D 125
1	1	1	0	E	SO E 14	RS 1E 30	. 2E 46	> 3E 62	N 4E 78	^ 5E 94	n 6E 110	~ 7E 126
1	1	1	1	F	SI F 15	US 1F 31	/ 2F 47	? 3F 63	O 4F 79	_ 5F 95	o 6F 111	DEL 7F 127

ROM No. 642

ASCII Code → ESC 1B 27 ← Hex ← Decimal

ESC Y= ¢
ESC Z= ¬

ASCII (641)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	@	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	[	k	{
1	1	0	0	C			,	<	L	\	l	|
1	1	0	1	D			–	=	M	]	m	}
1	1	1	0	E			.	>	N	^	n	~
1	1	1	1	F			/	?	O	_	o	

ESC Y= .
ESC Z= °

ROM No. 641

GERMANY/AUSTRIA (602)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	§	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	Ä	k	ä
1	1	0	0	C			,	²	L	Ö	l	ö
1	1	0	1	D			–	=	M	Ü	m	ü
1	1	1	0	E			.	³	N	°	n	ß
1	1	1	1	F			/	?	O	_	o	

ESC Y= I
ESC Z= ´

ROM No. 602

UK (644)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	@	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	[	k	{
1	1	0	0	C			,	<	L	\	l	|
1	1	0	1	D			–	=	M	]	m	}
1	1	1	0	E			.	>	N	^	n	~
1	1	1	1	F			/	?	O	_	o	

ESC Y= ¢
ESC Z= ¬

ROM No. 642

GERMANY/AUSTRIA (643)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	§	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	Ä	k	ä
1	1	0	0	C			,	<	L	Ö	l	ö
1	1	0	1	D			–	=	M	Ü	m	ü
1	1	1	0	E			.	>	N	^	n	ß
1	1	1	1	F			/	?	O	_	o	

ESC Y= ¢
ESC Z= ¬

ROM No. 643

FRANCE/BELGIUM (609)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	à	P	²	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	°	k	é
1	1	0	0	C			,	<	L	ç	l	ù
1	1	0	1	D			–	=	M	§	m	è
1	1	1	0	E			.	>	N	^	n	¨
1	1	1	1	F			/	?	O	_	o	

ESC Y= ³
ESC Z= I

ROM No. 645

SWEDEN/FINLAND (615)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	´	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			”	2	B	R	b	r
0	0	1	1	3			§	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	Ä	k	ä
1	1	0	0	C			,	<	L	Ö	l	ö
1	1	0	1	D			–	=	M	Å	m	å
1	1	1	0	E			.	>	N	^	n	¨
1	1	1	1	F			/	?	O	_	o	

ESC Y= ½
ESC Z= |

ROM No. 615

FRANCE (645)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	à	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	°	k	é
1	1	0	0	C			,	<	L	ç	l	ù
1	1	0	1	D			–	=	M	§	m	è
1	1	1	0	E			.	>	N	^	n	¨
1	1	1	1	F			/	?	O	_	o	

ESC Y= Fr
ESC Z= I

ROM No. 645

SWEDEN/FINLAND (647)

			b8	0	0	0	0	0	0	0	0
			b7	0	0	0	0	1	1	1	1
			b6	0	0	1	1	0	0	1	1
			b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	É	P	é	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			¤	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	Ä	k	ä
1	1	0	0	C			,	<	L	Ö	l	ö
1	1	0	1	D			–	=	M	Å	m	å
1	1	1	0	E			.	>	N	Ü	n	ü
1	1	1	1	F			/	?	O	_	o	

ESC Y= £
ESC Z= $

ROM No. 647

SWITZERLAND (FRENCH) (611)

				b8	0	0	0	0	0	0	0	0
				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	§	P	`	p
0	0	0	1	1			ç	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	[	k	ä
1	1	0	0	C			,	é	L	à	l	ö
1	1	0	1	D			–	=	M	]	m	ü
1	1	1	0	E			.	è	N	^	n	¨
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ESC Y= ¦
ESC Z= ´

ROM No. 611

DENMARK/NORWAY (646)

				b8	0	0	0	0	0	0	0	0
				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	@	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			§	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	Æ	k	æ
1	1	0	0	C			,	<	L	Ø	l	ø
1	1	0	1	D			–	=	M	Å	m	å
1	1	1	0	E			.	>	N	Ü	n	ü
1	1	1	1	F			/	?	O	_	o	

ESC Y= £
ESC Z= ¦

ROM No. 646

ITALY (613)

				b8	0	0	0	0	0	0	0	0
				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	ç	P	ù	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	°	k	à
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ESC Y= ¨
ESC Z= ½

ROM No. 613

SPAIN (605)

				b8	0	0	0	0	0	0	0	0
				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0				0	´	P	`	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			£	3	C	S	c	s
0	1	0	0	4			$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	¡	k	ª
1	1	0	0	C			,	º	L	Ñ	l	ñ
1	1	0	1	D			–	=	M	¿	m	ç
1	1	1	0	E			.	Pts	N	^	n	½
1	1	1	1	F			/	?	O	_	o	

ESC Y= ¨
ESC Z= ¦

ROM No. 605

CARE AND MAINTENANCE

Please carefully follow the instructions below so that your printer will always perform with the optimum efficiency.

Daisy Wheel:
Be extremely careful not to bend the petal or scratch the typeface when handling.

Cleaning:
An operator should periodically wipe and dust the interior of the printer to remove paper dust or residue with a soft cloth using mild cleaning solvent. Absolutely do not use an organic solvent like thinner. Also clean the exterior of the printer periodically to keep its appearance.

Do not use the printer in an environment where electro-static or electro-magnetic fields exist.

Service:
It is recommended that the printer be periodically checked by an authorized service engineer only. A recommended period is once a year at least.

IN CASE OF DIFFICULTY

Should difficulties be encountered, the following is a quick check list for possible causes:

The printer does not operate at all.	Make sure: — the power cord is plugged in. — the cable between host computer and the printer is properly connected. — the ON LINE Switch is not in OFF LINE mode. (ON LINE Lamp is lit.) — the type wheel is installed on the carriage. Installation of daisy wheel must be made after switching off the printer. — the ribbon is not entangled with the daisy wheel. If the ribbon is entangled, switch off the printer and correct the fault.
Paper does not advance.	Make sure: — the paper release lever is in closed position. — the paper is not jammed in the back of the platen or at the paper bail rollers.
Ribbon does not feed.	Make sure: — the ribbon is properly set. — the ribbon is not entangled with the daisy wheel or not twisted.

HEADQUARTERS
SILVER SEIKO LTD.
16-6, Shinjuku 2-chome,
Shinjuku-ku,
Tokyo 160, Japan
Tel: 3-356-6111
Telex: 232-2056
Fax: 3-341-7487

U.S.A.
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